Claims

1. A linear guide device including a guide rail, a slider main body having rolling element raceway surfaces opposing to rolling element raceway surfaces formed on the guide rail along the longitudinal direction of the guide rail, end caps each having rolling element direction changing channels in communication with a rolling element load rolling channel formed between both of rolling element raceway surfaces of the guide rail and the slider main body and in communication with rolling element return channels perforated through the slider main body along the longitudinal direction of the guide rail, a plurality of rolling elements that roll through the rolling element load rolling channel, the rolling element return channel, and the rolling element direction changing channel along with the relative linear motion of a slider comprising the slider main body and the end caps, and a plurality of separators each interposed between adjacent two rolling elements among the plurality of the rolling elements, in which the end cap has through-holes for assembling the rolling elements and the separators from the outside of the slider into the rolling element return channel.

2. A linear guide device according to claim 1, wherein the end cap has cap members for closing the through-holes.

3. A linear guide device according to claim 2, wherein the

cap members fit in the through-holes to form portions of the rolling element direction changing channel.

4. A linear guide device according to any one of claims 1 to 3, wherein the rolling element is a roller.

5. A linear guide device according to any one of claims 1 to 4, wherein the separator has a concave rolling element contact surface in contact with the rolling element.

6. A linear guide device according to any one of claims 1 to 5, wherein the separator includes a main body portion situating between the rolling elements and a pair of right and left arm portions disposed on both sides of the main body portion.

7. A linear guide device according to claim 6, wherein the through-hole has guide grooves slidably engaging the arm portions of the separator.

8. A linear guide device according to claim 6, wherein the rolling element return channel and the rolling element direction changing channel have guide grooves for slidably engaging the arm portions of the separator.

9. A linear guide device according to any one of claims 1 to 8, wherein the separators are connected in a row by a flexible belt-like connection member.

10. A linear guide device according to any one of claims 1 to 9, wherein the through-holes are formed in the end cap so as to oppose to the rolling element return channels.

11. A linear guide device according to any one of claims 1 to 10, wherein the through-holes are formed in the end cap coaxially with an extension line extended from the centerline of the rolling element return channel.

12. A linear guide device according to any one of claims 1 to 11, wherein the through-holes are formed in the end cap with an area of opening being larger than the area of opening for the rolling element return channel.

13. A linear guide device according to any one of claims 1 to 12, wherein the through-holes are formed in the end cap with an area of opening being substantially equal with the area of opening for the rolling element return channel.

14. A linear guide device according to any one of claims 1 to 13, wherein the through-holes are formed in the end cap so as to intersect the extension line extended from the center line of the rolling element return channel.

15. A linear guide device according to any one of claims 1 to 14, wherein the through-holes are formed into a shape including

a portion of the cross sectional shape of the rolling element return channel.

16. A linear guide device according to any one of claims 1 to 15, wherein the end cap has positioning portions for positioning the cap members.

17. A linear guide device according to claim 16, wherein the cap member has engaging portions engaging the positioning portions.

18. A linear guide device according to any one of claims 6 to 17, wherein the rolling elements and the separators are assembled from the through-hole into the slider by using a rolling element insertion jig having two inner wall surfaces opposing to the sides of the arm portion respectively.

19. A linear guide device according to claim 18, wherein the rolling element insertion jig is formed into a shape as fitting to the through-hole.

20. A linear guide device according to claim 19, wherein the end cap has positioning members that engage the top end of the rolling element insertion jig to position the rolling element insertion jig and position the cap member.

21. A linear guide device according to any one of claims 1 to

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3, wherein the rolling element is a ball.